

DATE: March 1, 2006

TO: Office of Drinking Water Staff

THROUGH: J. Wesley Kleene, Ph.D., P.E., Director
Office of Drinking Water

FROM: John I. Capito, P.E., Chairman
M/DBP Rule Team

SUBJECT: Water – Surveillance & Regulations – Long Term 2 Rule – Source Water Monitoring

SUMMARY STATEMENT:

This memo summarizes the requirements for source water monitoring, as prescribed in the Long Term 2 Enhanced Surface Water Treatment Rule (LT2), published in the Federal Register on January 5, 2006, and becoming effective on March 6, 2006.

BACKGROUND:

The requirements of LT2 apply to all waterworks using surface water or groundwater under the direct influence (GWUDI) of surface water. All applicable waterworks must conduct both an initial and a second round of source water monitoring for each plant that treats a surface water or GWUDI. The monitoring may include *Cryptosporidium*, *E. coli*, and turbidity. The results of the monitoring will determine the level, if any, of additional *Cryptosporidium* treatment that must be provided. This memo covers only the initial round of monitoring.

The following definitions apply to the implementation of this Rule:

- Combined distribution system (CDS) – the interconnected distribution system consisting of wholesale waterworks and of the consecutive waterworks that receive finished water.
- Consecutive system – a public distribution system that receives some or all of its finished water from one or more wholesale waterworks. Delivery may be through a direct connection or through the distribution system of one or more consecutive systems.

Wholesaling waterworks must perform their source water monitoring based on the schedule dates using the population of the largest waterworks in the CDS.

INITIAL SOURCE WATER MONITORING REQUIREMENT [§ 141.701 (a)]:

1. Filtered waterworks serving $\geq 10,000$ persons must sample for *Cryptosporidium*, *E. coli*, and turbidity in their source water at least monthly for 24 months.
2. Unfiltered waterworks serving $\geq 10,000$ persons must sample for *Cryptosporidium* in their source water at least monthly for 24 months.
3. Filtered waterworks serving $< 10,000$ persons must sample for *E. coli* at least once every two weeks for 12 months. However, these waterworks may elect to monitor for *Cryptosporidium* instead. If the waterworks elects to monitor for *Cryptosporidium*, they must notify us at the time they submit their schedule.

4. Unfiltered waterworks serving <10,000 persons must sample their source water for *Cryptosporidium* at least twice per month for 12 months, or once per month for 24 months.

Note: Waterworks may sample more frequently than required if the sampling frequency is evenly spaced throughout the monitoring period.

SAMPLING SCHEDULE [§ 141.702]

1. Waterworks required to conduct source water monitoring must submit a sampling schedule that specifies the actual calendar dates when the system will collect each sample. The schedule is due no later than three months prior to the required start date for sampling.
2. Waterworks must submit their schedule in written (paper) format to VDH for review. § 141.702(a)(2)(i) requires all waterworks serving more than 10,000 people to submit their LT2 monitoring plan to EPA electronically. We will advise Virginia's waterworks to use the alternative approach listed in § 141.702(a)(2)(ii) to allow them to submit through ODW. Under this alternative approach we will approve these plans, as well as all the rest of the plans for Virginia's waterworks, and forward the approval letters and documentation to IPMC for data entry.
3. VDH will review the proposed schedule and approve it no later than 30 days prior to the scheduled start of monitoring. (According to LT2, if we take no action on the schedule the waterworks must begin sampling on the schedule submitted.)
4. Our approval letter with copies of the approved schedule will be sent to the owner. A copy of the approval letter and schedule will be sent to IPMC in order to update the LT2 data base. The waterworks will not be entering this data directly into EPA's database.

SAMPLING LOCATIONS [§ 141.703]

A detailed description of the proposed sampling location(s) must be submitted at the same time as the proposed sampling schedule. VDH will review the proposed sampling location(s) along with the schedule, and comment on/approve at the same time. The following guidelines are to be used in evaluating the sample location:

1. Each water plant must monitor separately, except where multiple plants draw water from the same influent pipeline or intake. In such case a representative sample for all of the plants may be used.
2. Samples are to be collected prior to any chemical treatment, unless VDH makes a specific determination that:
 - a. sampling prior to chemical treatment is not feasible; and
 - b. the chemical treatment will not have any adverse impact on analysis of the sample.
3. If a waterworks practices recycle of the filter backwash, all samples must be collected prior to the point of any filter backwash water addition.
4. Plants with multiple water sources which include multiple surface water sources and blended surface water and ground water sources must use the following criteria:
 - a. The use of multiple sources during monitoring must be consistent with routine operational practice.
 - b. Must use a sample tap where the sources are combined prior to treatment, if available.

- c. If a combined sample tap is not available then samples must be collected at each source intake on the same day and must either:
- Composite the samples into one sample prior to analysis. (This composite must be flow weighted based on the proportion of the source in the total plant flow at the time the sample was collected.), or
 - Analyze each sample and calculate a weighted average of the analysis results for each sampling date. (The weighted average must be calculated by multiplying the analysis result for each source by the fraction the source contributed to total plant flow at the time the sample was collected and then summing these values.

Appendix A-1 provides a letter which may be used for approving the proposed sampling schedule and locations. Appendix A-2 provides a review form for evaluating the proposed schedule and locations.

SCHEDULE FOR PERFORMING MONITORING [§ 141.701 (c)]

Waterworks must submit the proposed sampling schedule and location(s), and begin monitoring, in accordance with the following dates:

WATERWORKS SERVICE POPULATION	WATERWORKS MUST SUBMIT SOURCE WATER MONITORING PLAN TO VDH BY	WATERWORKS MUST BEGIN SOURCE WATER MONITORING NO LATER THAN THE MONTH BEGINNING
≥ 100,000	July 1, 2006	October 1, 2006
50,000-99,999	January 1, 2007	April 1, 2007
10,000-49,999	January 1, 2008	April 1, 2008
< 10,000 and monitor for <i>E. coli</i> ¹	July 1, 2008	October 1, 2008
< 10,000 and monitor for <i>Cryptosporidium</i> ²	January 1, 2010	April 1, 2010

¹Applies only to waterworks which have filters.

²Applies to unfiltered waterworks and to filtered waterworks which elect to monitor for *Cryptosporidium* instead of *E. coli*.

WATERWORKS NOT PERFORMING SOURCE WATER MONITORING:

There are only two ways for a waterworks to avoid conducting the required source water monitoring. They are as follows:

1. A waterworks may avoid source water monitoring by electing to provide full treatment for *Cryptosporidium*. Filtered systems will be required to provide at least 5.5-log treatment, meeting the Bin 4 requirements specified in § 141.711. Unfiltered systems will be required to provide at least 3-log *Cryptosporidium* inactivation, meeting the requirements specified in § 141.712 (b) (2). Any waterworks choosing to provide treatment instead of performing source water monitoring must notify VDH in writing of such intent no later than the date established for submission of the monitoring plan.
2. A waterworks may use monitoring data collected prior to the start date of the required monitoring. The waterworks must notify VDH in writing of the intent to “grandfather” such data no later than the date the sampling schedule is due. All grandfathered data must meet the analysis criteria of LT2, and will be allowed to substitute on a month-for-month basis. If the grandfathered data does not cover the full number of months (24 or 12), or any data which

is rejected as not meeting the analysis criteria, additional samples must be collected in accordance with LT2, such that the full number of required months (24 or 12) are monitored. Grandfathered data must be submitted no later than two months after the date that monitoring would have begun (i.e., Schedule 1 systems must submit data to be grandfathered by December 1, 2006). Appendix B-1 provides a letter which may be used in approving grandfathered data. Appendix B-2 provides a review form for evaluating the proposed grandfather data. This appendix is subject to change due to pending release of EPA Guidance Manuals.

PUBLIC NOTIFICATION REQUIREMENTS

The owner or operator of a community or non-community waterworks required to monitor source water under LT2 must notify persons served by the waterworks that monitoring has not been completed as specified no later than 30 days after the waterworks has failed to collect any 3 months of monitoring as required. The notice will be treated as a Tier 2 public notice and the following language must be included:

We are required to monitor the source of your drinking water for *Cryptosporidium*. Results of the monitoring are to be used to determine whether water treatment at the (treatment plant name) is sufficient to adequately remove *Cryptosporidium* from your drinking water. We are required to complete this monitoring and make this determination by (required bin determination date). We "did not monitor or test" or "did not complete all monitoring or testing" on schedule and, therefore, we may not be able to determine by the required date what treatment modifications, if any, must be made to ensure adequate *Cryptosporidium* removal. Missing this deadline may, in turn, jeopardize our ability to have the required treatment modifications, if any, completed by the deadline required, (date).

For more information, please call (name of water system contact) of (name of water system) at (phone number).

LETTERS:

Copies of the final letters (Appendix A-1 and B-1) must be sent to:

LT2ESWTR and STAGE 2 DBPR
US EPA-IPMC
P O Box 98
Dayton, OH 45401-0098

END OF MEMO

Appendix A-1

Date

SUBJECT: (City or County)
Water - (System Name)
PWSID No. _____

Waterworks Owner Name

Address 1

Address 2

City/Town, VA ZIP Code

Dear _____:

We have received the proposed Long Term 2 Enhanced Surface Water Treatment Rule Source Water Monitoring Plan for the subject waterworks dated _____. This is to advise that the proposed monitoring schedule and sampling location(s) have been found by the Virginia Department of Health to meet the requirements of §§ 141.702 and 703 of the National Primary Drinking Water Regulations, and are hereby provisionally approved.

Please remember that all samples must be collected per the approved schedule (no more than 2 days before or 2 days after the scheduled date), and must be analyzed by a laboratory which has been approved by EPA for the specific analysis. The laboratory must report the results electronically to EPA. You will have the opportunity to review the data once it is posted on EPA's web tool. VDH will have access to the data upon notification of your acceptance of the data.

If you have any questions on this, please do not hesitate to call _____, District Engineer,

Sincerely,

Name

Engineering Field Director

cc: VDH – Central Office – ATTN: Steve Pellei
----- Health Department
U.S. EPA – Information Processing and Management Center

**LT2 RULE – SOURCE WATER MONITORING PLAN
REVIEW SHEET**

City/County: _____ Waterworks: _____ PWSID: _____ Water Plant: _____
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Sampling Schedule	
Number of months of monitoring required? Sufficient number of months scheduled? Specific dates identified in each month? (If either answer is No, revisions needed.)	<div style="display: flex; justify-content: space-between;"> <input type="checkbox"/> 24 <input type="checkbox"/> 12 </div> <div style="display: flex; justify-content: space-between;"> <input type="checkbox"/> Yes <input type="checkbox"/> No </div> <div style="display: flex; justify-content: space-between;"> <input type="checkbox"/> Yes <input type="checkbox"/> No </div>
Sampling Location(s)	
Does plant have more than one source? If yes, are flows combined prior to plant? If no, how will plant sample? Will plant monitor prior to addition of chemicals? Will plant monitor prior to addition of filter backwash water recycle? (if either answer is No, discuss.)	<div style="display: flex; justify-content: space-between;"> <input type="checkbox"/> Yes <input type="checkbox"/> No </div> <div style="display: flex; justify-content: space-between;"> <input type="checkbox"/> Yes <input type="checkbox"/> No </div> <div style="display: flex; justify-content: space-between;"> <input type="checkbox"/> Flow-weighted composite samples <input type="checkbox"/> Flow-weighted averaged results </div> <div style="display: flex; justify-content: space-between;"> <input type="checkbox"/> Yes <input type="checkbox"/> No </div> <div style="display: flex; justify-content: space-between;"> <input type="checkbox"/> Yes <input type="checkbox"/> No </div>

DETERMINATION:
 Monitoring Plan ☐ **IS** ☐ **IS NOT** acceptable.

Reviewed by: _____ Date: _____

Date

SUBJECT: (City or County)
Water - (System Name)
PWSID No. _____

*Waterworks Owner Name**Address 1**Address 2**City/Town, VA ZIP Code*

Dear _____:

We have received data from your waterworks, which is proposed for grandfathering under the Long Term 2 Enhanced Surface Water Treatment Rule. This is to advise that the data proposed for grandfathering has been found by the Virginia Department of Health (VDH) to meet the requirements of § 141.707, and is hereby provisionally approved.

↑ (option 1) This data meets all requirements for source water monitoring, for the full 24 (or 12) months required. No further monitoring is required. VDH will now proceed to the next step, of determining the bin placement for your waterworks.

↓ (option 2) While this data is acceptable, it does not meet the requirements for the full 24 (or 12) months of source water monitoring. Please see the attachment for a listing of months that will need to be monitored.

You will need to develop a schedule to address those months, and submit that schedule to VDH for approval within the next 30 days. Please remember that all samples must be collected per the approved schedule (no more than 2 days before or 2 days after the scheduled date), and must be analyzed by a laboratory which has been approved by EPA for the specific analysis. The laboratory must report the results electronically to EPA. You will have the opportunity to review the data once it is posted on EPA's web tool. VDH will have access to the data upon notification of your acceptance of the data.

If you have any questions on this, please do not hesitate to call _____, District Engineer,

Sincerely,

Name
Engineering Field Director

cc: VDH – Central Office – ATTN: Steve Pellei
----- Health Department
U.S. EPA – Information Processing and Management Center

Appendix B-2

**LT2 RULE – CRYPTOSPORIDIUM RESULTS
GRANDFATHERING OF DATA REVIEW SHEET**

City/County: _____
Waterworks: _____ PWSID: _____
Water Plant: _____
Evaluated By: _____ Date: _____

Signed cover letter certifying:	Yes	No
Data represents plant's current water source		
All source water <i>Cryptosporidium</i> results collected during the monitoring period are included		
Sample Data:		
All samples collected beginning January 1999		
Sample collection schedule established before monitoring started		
Additional documentation concerning re-sampling, use of pre-sedimentation, or use of off-stream storage during routine plant operations		
List of field and matrix spike (MS) samples, identified by sample ID and collection date		
At least 24 field samples collected monthly over a two-year period		
All applicable field results from the monitoring period are included		
Number of matrix spike samples is at least 5% of the number of field samples		
Minimum required data elements provided for all field and MS samples		
Minimum volume of 10 L analyzed for field samples		
For samples of less than 10 L, were at least 2 mL of packed pellet volume analyzed, or did two filters clog		
Samples collected from appropriate location(s)		
Laboratory:		
Laboratory is on EPA's "approved list"		
Laboratory certifies that all method-required QC requirements were acceptable for <u>all</u> field and MS samples		
Quality Control Information (if bench sheets/report forms provided in lieu of lab's letter):		
All samples were between 0°C and 8°C upon receipt		
All Ongoing Precision & Recovery (OPR) samples meet QC acceptance criteria		
An acceptable OPR sample associated with every field sample		
All method blank sample results acceptable		
An acceptable method blank sample associated with every field sample		
Spike levels of 500 oocysts or less used for all OPR and MS samples		
All holding times met for all field and QC samples (including composites, beginning when first sample began)		
Positive and negative staining controls associated with all field and QC samples		
Positive and negative staining controls acceptable for all field and QC samples		

DETERMINATION:

Monitoring data ☐ IS ☐ IS NOT acceptable for grandfathering.
 Additional monitoring ☐ IS ☐ IS NOT needed.